

REMARKS

Claims 19-26 are pending in this application. By this Amendment, claim 26 is added and claims 10, 12 and 13 are canceled. Support for the new claim may be found, for example, in the claims as originally filed and the specification at paragraph [0015]. No new matter is added.

In view of the foregoing amendments and following remarks, reconsideration and allowance are respectfully requested.

I. Rejections Under 35 U.S.C. §103

The Office Action rejects claims 10, 12, 13 and 19-25 under 35 U.S.C. §103(a) over U.S. Patent No. 4,769,073 to Tastu et al. ("Tastu") in view of EP 0 444 470 to Ashley et al. ("Ashley") and further in view of U.S. Patent No. 6,171,572 to Aozasa ("Aozasa") and U.S. Patent No. 5,264,010 to Brancaleoni et al. ("Brancaleoni"). By this Amendment, claims 10, 12 and 13 are canceled, thus the rejection is moot as to those claims. As to the remaining claims, Applicants respectfully traverse the rejection.

Claim 19 recites, *inter alia*, "An abrasive ... comprising a sol, which includes particles dispersed in an aqueous medium, wherein: the particles comprise as a main component crystalline cerium oxide of cubic system and as an additional component a lanthanum compound, neodymium compound or a combination thereof ... the abrasive has a pH of 3 to 6 or 8 to 10." Claim 22 recites similar features. Applicants respectfully assert that none of the applied references, individually or in combination, would have rendered obvious at least the above features of claims 19 and 22.

The Office Action, on pages 2-3, asserts that Tastu discloses an admixture that contains a cerium oxide and lanthanide salt and has a pH of greater than 6 but not less than 10. The Office Action cites Tastu, col. 7, line 19 - col. 8, line 7 in support of this assertion.

The Office Action further asserts that this portion of Tastu encompasses an abrasive having a pH of 3 to 6 or 8 to 10, as recited in claims 19 and 22. Applicants respectfully disagree.

As recited above, claims 19 and 22 recite an abrasive comprising a sol, which include particles dispersed in an aqueous medium, the particles comprise cerium oxide as a main component and a lanthanum compound, a neodymium compound, or a combination thereof as an additional component. Further, claims 19 and 22 require that this abrasive have a pH of 3 to 6 or 8 to 10. Particularly, claims 19 and 22 require that cerium oxide be present in an aqueous solution with a pH of 3 to 6 or 8 to 10. Tastu does not disclose and would not have rendered obvious the combination of cerium oxide in an aqueous medium with a pH of 3 to 6 or 8 to 10.

Tastu, at col. 7, line 19 discloses a ceric oxide and rare earth oxides present in polishing composition with 40% to 99.5% by weight of ceric oxide and 0.5% to 60% by weight of the rare earth oxides. This is the polishing composition of Tastu, and there is no pH disclosed for this composition. Thus, Tastu does not disclose or provide any reason or rationale for one of ordinary skill in the art to have combined ceric oxide and rare earth oxides with a basic solution that would yield an aqueous medium with a pH of 3 to 6 or 8 to 10. Tastu at col. 7, lines 28-39 discloses a process for making the above ceric oxide and rare earth oxide polishing composition, but this process for making the ceric oxide and rare earth oxide polishing composition does not itself comprise ceric oxide.

The process for preparing the ceric oxide and rare earth oxide composition of Tastu comprises two steps. In the first step, the different reagents are mixed. See Tastu, col. 7, lines 40-41. In this first step, an admixture including a solution of cerium salt—not cerium oxide—a basic solution, and a solution of at least one salt of a trivalent rare earth selected from among the lanthanides and yttrium is made. See Tastu, col. 7, lines 30-33 and lines 44-49. Further, Tastu discloses that a "proportion between the basic solution and a

solution of the cerium salt and the salt or salts of the rare earth or rare earths must be such that the number of basic equivalents introduced is greater than or equal to the number of cerium and rare earth or earths equivalents introduced simultaneously. It may be advantageous to use an excess greater than 5% of basic equivalents relative to the cerium and rare earth or earths equivalents. The pH of the reaction medium should then be greater than 6, but must not exceed 10." Tastu, col. 7, line 63 - col. 8, line 5 (emphasis added). Therefore, it is this basic solution in the first step of the process disclosed in Tastu that allows the reaction admixture to have a pH of greater than 6 but not greater than 10. However, this reaction admixture does not include the ceric oxide disclosed in Tastu, but rather this reaction admixture is a first step of the process that creates the ceric oxide and rare earth oxide composition of Tastu. Therefore, it cannot be said that this reaction admixture discloses both cerium oxide and an aqueous medium that has a pH of 3 to 6 and 8 to 10, as recited in claims 19 and 22.

In the second step of the process disclosed by Tastu used to create the ceric oxide and rare earth oxide composition, the reaction mass is filtered, and the filter cake may then be washed with water. See Tastu, col. 8, lines 39-43. The resulting filtrate is then dried, calcined, and ground. See Tastu, col. 8, lines 44-54. This drying, calcining and grinding process yields a powder that subsequently may be combined with an aqueous solution to yield a polishing composition that comprises ceric oxide and rare earth oxide. However, the combination of the resulting powder and the aqueous solution does not include a basic solution. Therefore there is no reason or rationale in Tastu for one of ordinary skill in the art to have expected that the powder obtained by the process disclosed in Tastu, when combined with an aqueous solution, would result in an aqueous medium that has a pH from 3 to 6 or 8 to 10.

Tastu discloses two separate compositions. The first composition is a reaction admixture that is an intermediary between the starting materials of Tastu and the final product of Tastu. This intermediary admixture comprises cerium salt—not cerium oxide—trivalent rare earth, and a basic solution. This intermediary composition has a pH that is greater than 6 but not greater than 10 as a result of adding the basic solution. Not only does this intermediary composition not include cerium oxide, as recited in claims 19 and 22, but Tastu provides no reason or rationale for one of ordinary skill in the art to have expected that this intermediary solution can or should be used as a polishing agent. Tastu further discloses that a suspension form by reacting the components of the intermediary solution results in a filtrate that can be dried, calcined and ground into a powder that may subsequently be used as an aqueous polishing composition. Nowhere does Tastu disclose or provide any reason or rationale for one of ordinary skill in the art to have used the dried, calcined and ground powder of Tastu in a basic solution as a polishing composition. Therefore, Tastu fails to disclose or provide any reason or rationale for one of ordinary skill in the art to have formed an abrasive that comprises a sol comprising cerium oxide and is in an aqueous medium that has a pH of 3 to 6 or 8 to 10.

Applicants have made similar arguments in previous responses, and the Office Action merely responds by asserting that Tastu discloses an admixture that contains a cerium salt and a lanthanide salt that has a pH of greater than 6 and less than 10. However, as discussed above, Tastu merely discloses a solution with a cerium salt, which is not the same as a cerium oxide, in an intermediary solution that has a pH of greater than 6, but less than 10. The admixture relied upon by the Office Action to disclose the claimed pH range is an intermediary admixture that does not contain cerium oxide, as claimed. Further, as discussed above, Tastu does not provide any reason or rationale for one of ordinary skill in the art to have halted the reaction process and used the intermediary admixture of Tastu as an abrasive.

Further, the Office Action does not apply the disclosures of Ashley, Aozasa or Brancaleoni to address the above discrepancies of Tastu. Thus, Applicants respectfully assert that the Office Action has failed to meet its burden of proving a *prima facie* case of obviousness at least because the Office Action has failed to provide a reference that either discloses or would have rendered obvious each and every feature of claims 19 and 22.

Furthermore, the Office Action relies on the Brancaleoni reference as disclosing an abrasive that further comprises a surfactant. See Office Action, page 6. The Office Action asserts that it would have been obvious to one of ordinary skill in the art to have used a surfactant as disclosed in Brancaleoni with the solution of Tastu because Brancaleoni allegedly discloses that the use of a surfactant provides an anti-scratching effect on the surface of the work piece that is being polished. See Office Action, page 6. However, Brancaleoni discloses polishing or planarizing electrical components, such as semiconductor work pieces. See Brancaleoni, col. 2, lines 36-40. However, claim 22, from which claim 26 depends, is directed to an abrasive for polishing an organic film. Brancaleoni fails to provide any reason or rationale for one of ordinary skill in the art to have been aware that the use of a surfactant would yield anti-scratching effects on an organic film. Thus, Applicants respectfully assert that it would not have been obvious to one of ordinary skill in the art to have used the surfactant disclosed in Brancaleoni with the solution disclosed in Tastu, as asserted in the Office Action. Thus, Tastu and Brancaleoni, individually or in combination, would not have rendered obvious each and every feature of newly added claim 26.

For at least the reasons stated above, claims 19 and 22, and newly added claim 26, would not have been rendered obvious by Tastu, Ashley, Aozasa and Brancaleoni, individually or in combination. Claims 20, 21 and 23-25 variously depend from claims 19 and 22 and, thus, also would not have been rendered obvious by Tastu, Ashley, Aozasa and

Brancaleoni, individually or in combination. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. New Claim

By this Amendment, new claim 26 is presented. New claim 26 depends from claim 22 and, thus, distinguishes over the applied references for at least the reasons discussed above with respect to claim 22, as well as for the additional features that it recites. Prompt examination and allowance of new claim 26 are respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the application are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Petition for Extension of Time
Request for Continued Examination

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